

PATENT  
Reply under 37 CFR 1.116  
EXPEDITED PROCEDURE  
Group 2862

AMENDMENT(S) TO THE CLAIMS

1-3 (cancelled)

4. (withdrawn) The position sensor of claim 1, wherein said ferrous plate varies in at least one of width, thickness and shape.

5. (previously presented) A position sensor for sensing linear or radial position, comprising:

at least four magnets, each of said at least four magnets producing a magnetic flux;

a first ferrous plate including a first side and a second side, said first ferrous plate having  
5 two of said at least four magnets located along said first side at spaced locations along said first ferrous plate, said two magnets being oriented such that a north pole of one of said two magnets is directed toward said first ferrous plate and a south pole of an other of said two magnets is directed toward said first ferrous plate;

a second ferrous plate including a first side and a second side, said second ferrous plate  
10 having an other two of said at least four magnets located along said first side at spaced locations along said second ferrous plate, said two magnets being oriented such that a north pole of one of said two magnets is directed toward said second ferrous plate and a south pole of an other of said two magnets is directed toward said second ferrous plate, said first ferrous plate and said second ferrous plate being generally parallel and spaced apart; and

15 at least one magnetic flux responsive device disposed between said second side of said first ferrous plate and said second side of said second ferrous plate, said at least one magnetic flux

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PATENT  
Reply under 37 CFR 1.116  
EXPEDITED PROCEDURE  
Group 2862

responsive device at least partially responsive to said magnetic flux from said at least four magnets.

6. (original) The position sensor of claim 5, wherein said magnetic flux responsive device is at least one of a Hall effect device and a programmable Hall effect device.

7. (previously presented) The position sensor of claim 5, further comprises at least one magnetic shunt disposed proximate to at least two of said at least four magnets, such that said at least one magnetic shunt shunts said magnetic flux.

8. (previously presented) The position sensor of claim 5, wherein said first ferrous plate and said second ferrous plate are both generally shaped as one of circular and cylindrical, said first ferrous plate being discontinuous thereby defining an air gap and said second ferrous plate being discontinuous thereby defining an air gap.

9. (previously presented) The position sensor of claim 5, wherein said at least one magnetic flux responsive device is configured to traverse beyond said first ferrous plate and said second ferrous plate.

10. (original) The position sensor of claim 5, wherein at least one of said first ferrous plate and said second ferrous plate varies in at least one of width, thickness and shape.

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PATENT  
Reply under 37 CFR 1.116  
EXPEDITED PROCEDURE  
Group 2862

11. (previously presented) A position sensor for sensing radial position, comprising:

two magnets each producing a magnetic flux, said two magnets including a first magnet and a second magnet;

two ferrous plates being generally shaped as one of circular and cylindrical, each said  
5 ferrous plate having an air gap, said two ferrous plates including a first ferrous plate and a second  
ferrous plate, said first magnet being coupled to said first ferrous plate, said first magnet being  
oriented with a north pole disposed toward an end of said air gap in said first ferrous plate and a  
south pole disposed toward an other end of said air gap, said second magnet being coupled to said  
second ferrous plate, said second magnet being oriented with a north pole disposed toward an end  
10 of said air gap in said second ferrous plate and a south pole disposed toward an other end of said  
air gap, said first ferrous plate and said second ferrous plate being generally parallel and spaced  
apart; and

at least one magnetic flux responsive device disposed between said first ferrous plate and  
said second ferrous plate, said at least one magnetic flux responsive device at least partially  
15 responsive to said magnetic flux from said two magnets.

12. (original) The position sensor of claim 11, wherein said magnetic flux responsive  
device is at least one of a Hall effect device and a programmable Hall effect device.

13. (previously presented) The position sensor of claim 11, further comprising at least  
one magnetic shunt disposed proximate to at least one of said two magnets, such that said at least  
one magnetic shunt shunts said magnetic flux of at least one of said two magnets.

WOR0001.CIP

PATENT  
Reply under 37 CFR 1.116  
EXPEDITED PROCEDURE  
Group 2862

14. (original) The position sensor of claim 11, wherein said north pole of said first magnet is generally directed in a direction contra to said north pole of said second magnet.

15. (original) The position sensor of claim 11, wherein at least one of said two ferrous plates varies in at least one of width, thickness and shape.

16. (original) The position sensor of claim 11, wherein said at least one magnetic flux responsive device produces an electrical signal relative to the sensed magnetic flux density.

17. (previously presented) A method for making and installing a device for sensing one of linear and radial position, comprising:

spacing a first ferrous plate and a second ferrous plate apart in a generally parallel manner;

orienting two magnets toward said first ferrous plate and two additional magnets toward

5 said second ferrous plate such that a north pole of one said magnet and a south pole of an other said magnet are directed toward said first ferrous plate and a north pole of yet an other said magnet and a south pole of still yet another magnet is directed toward said second ferrous plate;

positioning a magnetic flux responsive device between said first ferrous plate and said second ferrous plate such that movement of said magnetic flux responsive device relative to said  
10 first ferrous plate and said second ferrous plate alters the magnetic field in said magnetic flux responsive device said magnetic flux responsive device being closer to said first ferrous plate and said second ferrous plate than to said two magnets; and

WOR0001.CIP

PATENT  
Reply under 37 CFR 1.116  
EXPEDITED PROCEDURE  
Group 2862

mounting said ferrous plates to a structure including one of a foot pedal, a throttle, an  
EGR valve, a shaft and a headlight leveling system, and said magnetic flux responsive device on  
15 an other structure, said magnetic flux responsive device and said ferrous plates configured to  
move relative to each other.

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